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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/648,594	08/25/2003	Ga-Lane Chen		4258
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25859	7590	11/10/2004
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EXAMINER

VORTMAN, ANATOLY

ART UNIT

PAPER NUMBER

2835

DATE MAILED: 11/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/648,594

Applicant(s)

CHEN ET AL.

Examiner

Anatoly Vortman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2004 (Election).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 12-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) 10 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) ✓
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) ✓
Paper No(s)/Mail Date 8/25/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-11 in the reply filed on 10/08/04 is acknowledged. Non-elected claims 12-19 are withdrawn from further consideration on the merits.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-6 and 8, are rejected under 35 U.S.C. 102(e) as being anticipated by US/2004/0097635 to Fan et al., (Fan).

The applied reference has a common assignee (Hon Hai Precision Ind. Co., LTD) with the instant application. Based upon the earlier effective U.S. filing date of the reference (03/31/03), it constitutes prior art under 35 U.S.C. 102(e) (US filing date of the

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instant application is 08/25/03). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claims 1 and 2, Fan disclosed (Fig. 6, 7) a thermal interface material (40) comprising: a polymer matrix (32) having a thermally conductive first face (42) and an opposite thermally conductive second face (44); and a plurality of carbon nanocapsules (32) incorporated in the polymer matrix (22), wherein the polymer is a reaction product of a polyether polyol and an isocyanate (column 4, lines 3+).

Regarding claim 8, Fan disclosed that said carbon nanocapsules are enclosed with thermally conductive material (42, 44).

Regarding claims 3-6, the claims recite ingredients and ranges for said ingredients, used for forming the end product and therefore, are directed to a method of forming the device. It has been held that even though the claims are limited by and defined by the recited process, the determination of patentability of the product is based on the product itself, and does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). Therefore the claims had not been given patentable weight.

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4. Alternatively, claims 1-6 and 8, are rejected under 35 U.S.C. 102(a)(e) as being anticipated by US/6,407,922 to Eckblad et al., (Eckblad) (cited on IDS).

Regarding claim 1, Eckblad disclosed (Fig. 1 and 2) a thermal interface material (5) comprising: a polymer matrix (15) having a thermally conductive first face (11) and an opposite thermally conductive second face (13); and a plurality of carbon nanocapsules (17) incorporated in the polymer matrix (15).

Regarding claim 8, Eckblad disclosed that said carbon nanocapsules (17) are enclosed with thermally conductive material (11, 13).

Regarding claims 2-6, the claims recite ingredients and ranges of said ingredients used for forming the end product and therefore, are directed to a method of forming the device. It has been held that even though the claims are limited by and defined by the recited process, the determination of patentability of the product is based on the product itself, and does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). Therefore the claims had not been given patentable weight.

5. Yet, alternatively, claims 1-6 and 8, are rejected under 35 U.S.C. 102(e) as being anticipated by US/2004/0005736 to Searls et al., (Searls).

Regarding claim 1, Searls disclosed (Fig. 3) a thermal interface material (26) comprising: a polymer matrix (40) having a thermally conductive first face (12) and an

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opposite thermally conductive second face (16); and a plurality of carbon nanocapsules (38) incorporated in the polymer matrix (40).

Regarding claim 8, Searls disclosed that said carbon nanocapsules (38) are enclosed with thermally conductive material (12, 16).

Regarding claims 2-6, the claims recite ingredients and ranges for said ingredients used for forming the end product and therefore, are directed to a method of forming the device. It has been held that even though the claims are limited by and defined by the recited process, the determination of patentability of the product is based on the product itself, and does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). Therefore the claims had not been given patentable weight.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7 and 9, are rejected under 35 U.S.C. 103(a) as being unpatentable over either Eckblad or Searls, each taken alone.

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Regarding claim 7, Eckblad or Searls disclosed all, but that the diameter of the nanocapsule is in the range from 5 to 50nm.

It would have been obvious to a person of ordinary skill in the nanotechnology arts at the time the invention was made to form nanocapsules having diameter in any desirable range, including the aforementioned 5 to 50nm, in order to achieve a desired rate of the heat exchange, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 9, Eckblad or Searls disclosed all as apply to claim 8, but that said thermally conductive material is indium or copper.

Since indium and copper have been notoriously known in the cooling art at the time the invention was made as good thermal conductors and have been extensively used for making heat conductive components, it would have been obvious to a person of ordinary skill in the cooling art at the time the invention was made to select indium or copper as the thermally conductive materials of Fan, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Allowable Subject Matter

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8. Claims 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 10 and 11, parent claim 10 recites: "metal nano-grains". The aforementioned limitations in combination with all remaining limitations of claim 10, are believed to render said claims 10 and 11 patentable over the art of record.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure:

US/5344676, 5641466, 5698175, 5742471, 4753088, 5780101, 5965267, 6473351, 2003/0111333, and 6278231 teach nanostructures and methods of making.

US/5077637, 5316080, 5390734, 5566752, 5898569, 6052280, 6060166, 6131651, and 6542370, disclosed cooling arrangements utilizing carbon fibers.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anatoly Vortman whose telephone number is 571-272-

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2047. The examiner can normally be reached on Monday-Friday, between 10:00 am and 6:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Lynn Feild can be reached on 571-272-2092. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anatoly Vortman
Primary Examiner
Art Unit 2835

AV

